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IS : 1850 - 1961
(Reaffirmed 1977)

Indian Standard

DIMENSIONS FOR SHANK DIAMETERS AND DRIVING SQUARES FOR ROTATING TOOLS

(Third Reprint SEPTEMBER 1982)

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 2

December 1961

AMENDMENT NO. 1 MAY 1998
TO
IS 1850 : 1961 DIMENSIONS FOR SHANK DIAMETERS AND DRIVING SQUARES FOR ROTATING TOOLS

(*Page* 2, *Foreword, clause* 0.5) — Substitute the following for the existing matter:

"0.5 This Indian Standard is based on Draft ISO Recommendation No. 303 'Tool shank diameters and driving squares', issued by the International Organization for Standardization. Now, ISO 237 : 1975 'Rotating tools with parallel shanks — Diameters of shanks and sizes of driving squares' has been published on the subject which is technically equivalent to this Indian Standards."

(PE 10)

Reprography Unit, BIS, New Delhi, India

Indian Standard

DIMENSIONS FOR SHANK DIAMETERS AND DRIVING SQUARES FOR ROTATING TOOLS

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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Indian Standard
DIMENSIONS FOR SHANK DIAMETERS AND DRIVING SQUARES FOR ROTATING TOOLS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 18 August 1961, after the draft finalized by the Small Tools Sectional Committee had been approved by the Engineering Division Council.

0.2 Squares are provided on the shank ends of small tools, such as reamers and screwing taps for holding and driving. In some cases, an internal square is provided.

0.3 The complete range of diameters is divided into diameter groups and for each group, the corresponding size of square is given. In the principal series, the table gives the preferred diameter of shank for each diameter group which is actually the mean value for that group and corresponds to the theoretical optimum ratio $a/d = 0{\cdot}8$. It is, therefore, recommended that the diameters of shanks should be chosen from those indicated as preferred, or when the choice is limited to specific values only, the value nearest to the mean shall be selected.

0.4 In the secondary series, the diameter groups are comparatively smaller and the preferred shank diameter is not given. It is recommended that the secondary series should be used only if a finer subdivision in the small diameter range is absolutely necessary.

0.5 Taking into consideration the views of consumers and manufacturers of small tools, the Sectional Committee responsible for the preparation of this standard felt that it should be related to the international practice, which led the Committee to base this standard on Draft ISO Recommendation No. 303 Tool Shank Diameters and Driving Squares, issued by the International Organization for Standardization.

0.6 In this standard, the tolerances are given in the ISO system of limits and fits as recommended in *IS : 919-1959 Recommendations for Limits and Fits for Engineering.

0.7 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with the latest version of IS : 2-1960 Rules for Rounding Off Numerical Values (*Revised*).

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*Since revised.

The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard specifies the preferred diameters of shanks and dimensions for external and internal squares provided for rotating small tools.

2. DIMENSIONS

2.1 Principal Series — The dimensions for driving squares for general purposes shall be as given in Table I.

2.2 Secondary Series — For finer subdivision, the dimensions shall be as given in Table II (*see also* **0.4**).

3. TOLERANCES

3.1 Tolerance on Dimensions *a* (Across Flats):

For external square—h12 including errors of form and position (Recommended manufacturing tolerance h11)

For internal square—D11

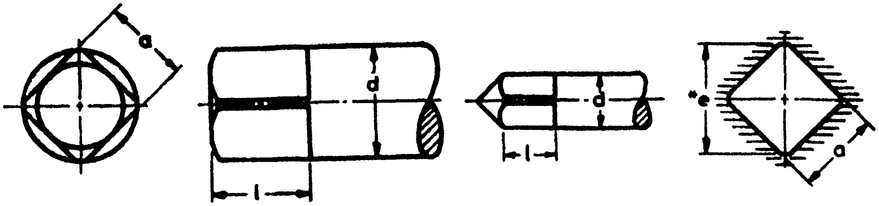
3.2 Tolerance on Diameter of Shank *d*:

For precision tools—h9 } unless otherwise specified
For other tools—h11 }

TABLE I DIMENSIONS FOR PRINCIPAL SERIES OF SHANK DIAMETERS AND DRIVING SQUARES

(*Clause* 2.1)

All dimensions in millimetres.



External Square

Alternative Form for Small Diameters

Internal Square

Shank Diameter *d*			Square	
Preferred Diameter	Over	Up to and Including	*a*	*l*
1·12	1·06	1·18	0·90	4
1·25	1·18	1·32	1·00	
1·40	1·32	1·50	1·12	
1·60	1·50	1·70	1·25	
1·80	1·70	1·90	1·40	
2·00	1·90	2·12	1·60	
2·24	2·12	2·36	1·80	
2·50	2·36	2·65	2·00	
2·80	2·65	3·00	2·24	5
3·15	3·00	3·35	2·50	
3·55	3·35	3·75	2·80	
4·00	3·75	4·25	3·15	6
4·50	4·25	4·75	3·55	
5·00	4·75	5·30	4·00	7
5·60	5·30	6·00	4·50	

(*Continued*)

TABLE I DIMENSIONS FOR PRINCIPAL SERIES OF SHANK DIAMETERS AND DRIVING SQUARES — *Contd*

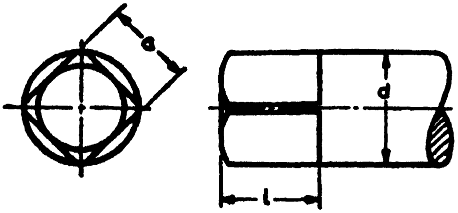
SHANK DIAMETER d			SQUARE	
Preferred Diameter	Over	Up to and Including	a	l
6·30	6·00	6·70	5·00	8
7·10	6·70	7·50	5·60	
8·00	7·50	8·50	6·30	9
9·00	8·50	9·50	7·10	10
10·00	9·50	10·60	8·00	11
11·20	10·60	11·80	9·00	12
12·50	11·80	13·20	10·00	13
14·00	13·20	15·00	11·20	14
16·00	15·00	17·00	12·50	16
18·00	17·00	19·00	14·00	18
20·00	19·00	21·20	16·00	20
22·40	21·20	23·60	18·00	22
25·00	23·60	26·50	20·00	24
28·00	26·50	30·00	22·40	26
31·50	30·00	33·50	25·00	28
35·50	33·50	37·50	28·00	31
40·00	37·50	42·50	31·50	34
45·00	42·50	47·50	35·50	38
50·00	47·50	53·00	40·00	42
56·00	53·00	60·00	45·00	46
63·00	60·00	67·00	50·00	51
71·00	67·00	75·00	56·00	56
80·00	75·00	85·00	63·00	62
90·00	85·00	95·00	71·00	68
100·00	95·00	106·00	80·00	75

*The minimum value of a for internal square is equal to the maximum shank diameter d of that diameter group.

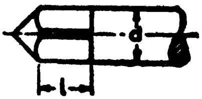
TABLE II DIMENSIONS FOR SECONDARY SERIES OF SHANK DIAMETERS AND DRIVING SQUARES

(*Clause* 2.2)

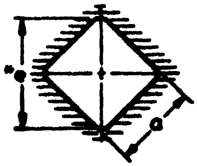
All dimensions in millimetres.



External Square



Alternative Form for Small Diameters



Internal Square

Shank Diameter *d*		Square	
Over	Up to and Including	*a*	*l*
1·06	1·12	0·90	4
1·12	1·18	0·95	
1·18	1·25	1·00	
1·25	1·32	1·06	
1·32	1·40	1·12	
1·40	1·50	1·18	
1·50	1·60	1·25	
1·60	1·70	1·32	
1·70	1·80	1·40	
1·80	1·90	1·50	
1·90	2·00	1·60	
2·00	2·12	1·70	
2·12	2·24	1·80	
2·24	2·36	1·90	
2·36	2·50	2·00	
2·50	2·65	2·12	

(*Continued*)

TABLE II DIMENSIONS FOR SECONDARY SERIES OF SHANK DIAMETERS AND DRIVING SQUARES — *Contd*

SHANK DIAMETER *d*		SQUARE	
Over	Up to and Including	*a*	*l*
2·65	2·80	2·24	5
2·80	3·00	2·36	
3·00	3·15	2·50	
3·15	3·35	2·65	
3·35	3·55	2·80	
3·55	3·75	3·00	
3·75	4·00	3·15	6
4·00	4·25	3·35	
4·25	4·50	3·55	
4·50	4·75	3·75	
4·75	5·00	4·00	7
5·00	5·30	4·25	
5·30	5·60	4·50	
5·60	6·00	4·75	
6·00	6·30	5·00	8
6·30	6·70	5·30	
6·70	7·10	5·60	
7·10	7·50	6·00	
7·50	8·00	6·30	9
8·00	8·50	6·70	
8·50	9·00	7·10	10
9·00	9·50	7·50	

*The minimum value of *e* for internal square is equal to the maximum shank diameter *d* of that diameter group.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Definition*
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	Pascal	Pa	1 Pa = 1 N/m^2

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